

Immersive Learning Environments in Parallel Universes: Learning through Second Life

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Opportunities for more creative and innovative environments for learners continue to develop through distance education. Especially at the post-secondary level, these immersive environments can involve high-end video game technologies to create multi-user virtual worlds that can both replicate and far extend physical classrooms. At San Jose State University's School of Library and Information Science, courses offered in and through Second Life develop both competence and comfort in working with library users. Several useful lessons have also been learned.

Introduction

Educators who teach at a distance strive to ensure students achieve similar outcomes as those who sit in lecture halls; indeed, course syllabi for face-to-face, hybrid and distance delivery typically have the same intended learning outcomes. The implicit goals of going online are to increase flexibility for working adults while maintaining high standards. Ideally, outcomes for these radically divergent modes should be equivalent. Creating this comparable curriculum is simple for some exercises but quite complex for others. Distance educators have known for many years how to replace in-person lectures by mailing work books, hosting telephone conferences, and asking students to submit assignments by mail. More recently, digital content added richness and immediacy to lessons. Text designs were augmented with colorful animations, sound and video. Schools such as the Open University in the UK began shipping CD-ROMs with their textbooks (Jones, Kear, & Reilly, 1998)--and students came to expect immediate response from teachers even in far off states. Timeliness is no longer a function of geography but rather of psychological presence (Garrison, Anderson & Archer, 1999) and transactional distance (Moore, 1993) between teacher and student.

More importantly, skilled online faculty engage student communities using automated media tools to support discourse and set climates for learning. They upload documents and media files and use threaded message forums to help students reflect on content.

Educators are seeking to establish learner-centered, participatory environments in a constructivist pedagogical framework. With newer technologies and newer possibilities for distance learning, these environments are part of the distributed learning communities of the institution. Entrepreneurial programs readily evaluate these promising technologies and adopt tools that show possibilities for enriching the learning process.

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Virtual Environments

Immersive 3D worlds allow teachers to recreate a real or idealized world or to create completely new worlds, providing experiences that can help students in understanding concepts as well as learning to perform specific tasks. Reality is often quite messy, involving complex trade-offs and compromises. A virtual environment can model the complexities and uncertainty of working in the real world. This helps students develop an ability to solve high-level problems, especially problems that are poorly structured. They can carry out authentic tasks as real workers would, explore new terrain, meet people of different cultures, and use a variety of tools to gather information and solve problems. A very simple, yet deceptively complex example is staffing a reference or information desk in a virtual academic or public library, receiving hundreds of typical real world questions each week. (Volunteers are scheduled on [Inforisland](#).) As a discipline and as a profession, Library and Information Science (LIS) has been tremendously impacted by technology. Many LIS graduates work with younger generations of people who have spent many hours playing digital games (Kaiser Family Foundation, 2005). These students are used to deeply engaging, visually dynamic, rapidly paced and highly gratifying pictorial experiences. They are also very comfortable socializing online, getting their news online, and doing research online.

As a consequence, post-secondary institutions need to graduate librarians who can build virtual spaces that provide user-centered services and facilitate and promote collaboration among "digital natives". They need to create spaces that attract digital natives. Using virtual environments LIS students can experiment with creating virtually a 21st century public library environment, or a medical informatics environment, or a teen space, or an information commons for an academic library. After graduation, they can help to implement these new spaces.

For teacher-librarians and their colleagues there are also newer definitions of literacy (New Media Consortium, 2005). This incorporates newer trends of user- and student-created content where amateur producers upload their own creations and comment on each other's work in a highly engaging social web (Abram, 2006). And, of course, libraries too are exploring roles for themselves in virtual worlds (see, for example, [Infoisland](#)).

When Games Become Tools

This system builds on previous video game technology but offers much greater flexibility to teach from custom-created content. Computer games have given birth to an exciting new platform for online teaching and training. The Second Life virtual world allows faculty, students and instructional designers to create an unlimited variety of objects, activities, and metaphorical structures. This virtual reality system brings a new level of interactivity and engaging realism to the classroom.

Educational institutions in the U.S. and Europe are adopting these new tools to varying degrees. San Jose State University's School of Library and Information Science first became involved with this virtual environment in the summer of 2006. Noting that library users were beginning to engage with Second Life and that isolated experimentation was beginning to occur in higher education, the School sought and received a grant to purchase an "island". (The grant enabled the School to avoid the many subsequent questions about using thousands of "real"

dollars to buy “not-so-real” real estate.) Students then engaged with an instructional designer to build a campus on the island, complete with classrooms, labs, offices and library resources. The School offered the U.S.’s first graduate-level LIS class on virtual worlds in summer, 2007. (The introduction to the School’s development of a virtual campus can be viewed at <http://www.youtube.com/user/jeremykemp>.)

Students and teachers create “avatars” and log in to a central server to interact with each other in completely custom-built learning settings. {A video “[Demonstration of Changing Avatar Appearance in Second Life](#)” } They don microphones and headsets to communicate as they walk around fanciful duplicates of library spaces, scenes from great literature and models from the world’s exotic locales. Stroll the streets of Dublin, wear an Elizabethan costume onstage in Shakespeare’s Old Globe Theatre or tour the mosques of Morocco.

{Video of an Irish television new report on [Second Life Dublin](#).}

{Video of the [opening of Globe Theatre](#) on Renaissance Island in Second Life}

{Video of Johnson & Wales University’s [Virtual Morocco island](#).}

And in Second Life, game play is replaced by open-ended opportunities for exploration and invention. This has tremendous implications for teaching and for delivering information in exciting and highly engaging packages.

Second Life is maintained by Linden Lab of San Francisco, CA and has spawned a new wave of virtual world start-ups and content providers. But all “players” in the system have access to the complete set of creation tools. Many spend hundreds of hours learning to fashion clothing, build furniture, assemble vehicles and conduct commerce with real money trading hands (Ondrejka, 2004). The ease and flexibility of the content toolset inspires amazing feats of creativity and community building among teachers and librarians. {SJSU student Robin Williams’ video “[What is Second Life?](#)”}

Virtual worlds for education offer shared space where many users participate at the same time from their distant homes. These tools offer “graphical user interfaces” that depict space visually, ranging in style from 2D “cartoon” imagery to more immersive 3D environments. Most interaction takes place in real time but the tools included in the platform allow users to alter, develop, build, or submit customized content. This creation process results in learning materials and experiences for students even when class is not in session. Perhaps most interesting is the effect this setting has on socialization and communities. It allows and even encourages in-world social groups like guilds, clubs, cliques, housemates, neighbourhoods.

Multi User Virtual Environments show exciting promise, with millions of users and subscribers. They are used in trials by companies such as Cisco, Adidas, Circuit City, Dell, Sears, and Toyota and one technology think tank predicts 80% of Internet users will exploit them by 2011 (Wagner, 2007). The three most popular and heavily used virtual worlds feature fantasy role-play motifs: World of Warcraft, Lineage and Runescape (Woodcock, 2008). The most popular platforms for educational projects are Active Worlds (Barab, Hay, Barnett, & Squire, 2001; Dede, Bowman, Nelson, Clarke, & Ketelhut, 2004), NeverWinter Nights (Baker, 2008) and Second Life (Cohen, 2006).

San Jose Enters the Game

When the School first started using this platform, Second Life had about 300,000 user accounts (Au, 2006; Rubel, 2006)–and now the account population has expanded to over 12 million (Second Life, 2008). A student’s view of the construction can be seen at: A video overview of the [SJSU SLIS Second Life Campus](#) under construction from Spring of 2007. The rate of educational adoption has resulted in a vibrant community and considerable press coverage, including popular mass market periodicals such as *U.S. News and World Report*. The grand opening attracted participants from around the globe: [SJSU SLIS Second Life Ribbon Cutting](#)

Learning Laboratory

Although you wouldn’t necessarily expect to see a high-end video game devoted to building abilities in library science, Second Life offers a container to set up video game-like experiences using tools that are not bonded to fantasy violence and gore. The system includes the 3D modeling tools as well as a simplified programming language to build automated simulations. {Tutorial video from the University of Kansas Medical Center showing [how avatars interact with objects](#):}

Second Life has no set game play pathways or unchangeable content, such that designers are free to refashion the “video game” tools into an open-ended social laboratory for experiential learning. Toward that end, the San Jose School is experimenting with a number of projects in Second Life:

A library design toolkit- Because of its flexibility, easy tools, and its ability to facilitate rapid prototyping, Second Life is useful for creating *faux* library spaces and evaluating how clients might use them. Toward that end, the School has, for example, a number of trials of furnishings, aesthetic design, and shelving systems for teens in library settings.

A student commons- The program has students spread throughout the United States and abroad. This platform offers students a “place” to meet each other informally and enjoy a social setting away from formal study content but still “on campus”.

A social skills venue- As is typical of the profession generally, many of San Jose’s students are introverted (Schnerdin, 1994) and some fear public speaking (Sommer, 2005). We are experimenting with this virtual reality platform to simulate the experience of getting up in front of classmates and making presentations. And this use of virtual reality to deal with fears and phobias is well established.

A lecture hall- for some very specific topics, Second Life provides an excellent opportunity to deliver lectures including slides and voice variation. It is important to acknowledge, however, that several tools available to the school are much easier to use for this such as Web-conferencing programs like Elluminate. {SJSU student Robin Williams’ video [“Second Life Basics: Getting to Class”](#) }

The U.S.’s First Course in Immersive Environments

The School’s virtual worlds course is designed to fit closely with the MLIS program’s [core competencies](#). Students must demonstrate mastery of 16 competencies through an e-

portfolio near the end of their studies. Students can use Second Life to show mastery of three of these competencies in particular:

- design, query and evaluate information retrieval systems;
- demonstrate proficiency in the use of current information and communication technologies, and other related technologies, as they affect the resources and uses of libraries and other types of information providing entities;
- understand the system of standards and methods used to control and create information structures and apply basic principles involved in the organization and representation of knowledge.

For the first round, summer, 2007 (Kemp 2007a), the graduate course in immersive environments was taught completely asynchronously and had no requirements for weekly meetings or in-person sessions. Grading and points were awarded for six activities including a literature survey paper, three projects and participation in the class website discussion forum. Students gave strong feedback in after-course surveys that they missed the “in-person” benefits of Second Life interaction and wanted more structured class time. In autumn (Kemp, 2007b) the synchronous meetings became more structured and the class ended in a culminating experience that mirrored the school’s e-portfolio assessment program. Students spent the last week or so arranging their previous work into a coherent presentation and installation built onto the SJSU island. The goal of this assignment was two-fold. It gave the students time to reflect upon and arrange their work in a new platform and also leveraged the students’ motivation to make progress toward the program’s required objectives. For spring (Kemp, 2008) the course offered two strong improvements: 1) highly structured “lectures” during the weekly synchronous sessions, following content from the text (White, 2007); and 2) biweekly “quests” where students set their own schedule and mostly work on their own. Faculty are necessarily sensitive to the “time zone composition” of the class when scheduling synchronous activity.

Student Response

A small sample of 14 students in the virtual worlds course responded to a course survey. Most were female (79%), part-time students (60%), 32 years old on average. These were gamers: 93% of students surveyed in the two courses agreed or strongly agreed with the statement “Playing computer games is fun.” Most students (79%) agreed or strongly agreed that they “enjoyed using Second Life as a learning setting” and disagreed or strongly disagreed with the statement “Second Life is not good for distance education” (64%); 71% agreed or strongly agreed that they are “more positive about Second Life now that I have experienced it.”

The survey also uncovered some important downsides. Students complained about unpleasant encounters with people unaffiliated with the university: 73% agreed or strongly agreed with the statement, “Intentionally disruptive people (avatars) made the class less enjoyable.” Students also commented on this problem informally during the classes. Students just starting out with new accounts were most vulnerable and suffered bouts of harassment in the general Second Life orientation space. The SJSU island space was relatively free from this kind of harassment by strangers. The space is connected to a large number of university and library islands. Neighbours include Stanford University Libraries, the Digital Library Federation and the Alliance Library System of Illinois. In the one calendar year period the SJSU

island has been open to the public, only two severe "griefing" incidents took place—both involving large numbers of objects scattered around the space. Think of this as graffiti.

Some students were involved beyond the instructor's expectations in the virtual world. They logged on often, sometimes late into their night and seemed to shift their personal priorities to make time for visits. Most students (57%) agreed or strongly agreed "Someone I knew complained about the excess time I spent using SL." The Vice-President of Community at Linden Lab, makers of Second Life, defines this effect as becoming a "resident" of the system (Harper, 2007). And one autumn student used the system to socialize because she was bedridden and required daily medical treatment. She created a vibrant social life complete with glamorous outings, music and dancing, all from her bed and between treatments.

Indeed, the engaging attributes of the platform show great promise for enriching study time for distance education students. Highly engaged students described the feeling of "flow" (Csikszentmihalyi, 1990) such as losing track of time, feeling in better control of their own actions, losing their sense of self-consciousness, and following intrinsic motivations rather than being forced to complete the tasks by grading and deadlines. Most students thought the skills they built would impact their careers. This was borne out when several students obtained real-life internships, contract work, and full-time employment through their work in Second Life. Many (71%) of the students appreciated working with clients from the Second Life community.

Second Life does not seem well suited to reflection and deep learning. Tools for sharing long-form documents and asynchronous threaded messaging just don't exist. And so a large majority (86%) of students disagreed or strongly disagreed with the statement, "Second Life documents (note cards, scripts, etc.) should be the only required writing in the class." It is essential that teachers working with the Second Life environment blend it with reflected exercises and shared documents using a learning management system such as the Blackboard system currently used at San Jose.

Almost all (93%) of students agreed or strongly agreed with the statement "I feel more prepared to make recommendations about SL to colleagues and managers." This is a key instructional objective for the course because it covers an emergent medium and serves early adopters who are seen as experts in their work setting. Through orientation and training for interested faculty and the use of peer (faculty and student) tutors for faculty, use of immersive environments has been embedded in a wide variety of courses from core foundations of library and information science to reference and information services to teen services.

Suggestions for Further Study

Several areas become apparent for further research and development.

Adoption and support: The adoption pathways for faculty in traditional distance learning programs are fairly well established and understood. Starting in the mid-1990s, service providers offered turnkey packages for schools and universities using the Internet to deliver classes. The user interfaces, inter-connection with administrative systems, and proven learning activities are mastered. Both faculty and staff are quite comfortable with these technical systems. Furthermore, the skill set required to operate these systems is basically identical to that of the wider Internet-using community. Documents are formatted, discussions held and emails sent. But this easy familiarity is very much not the case with virtual environments. Though

immersive computer gaming has a relatively long history, the use of these systems for formal teaching and learning is radically new. Both faculty and students are woefully unprepared and supported to manoeuvre in immersive space. Much research is needed to fine-tune both the academic processes and administrative infrastructure necessary to develop and support these systems.

Curriculum development: The fundamental principles of instructional design do not change with the varying media. But changing media require new production processes and make reachable some learning outcomes that were previously impossible. For instance, in a web-based online class an instructional developer would decide on intended learning outcomes, create and upload documents, design enrichment activities and arrange a communal learning space. Media content is usually the equivalent of pieces of paper—flat and usually sequential, thus limiting potential learning outcomes. A teacher, for instance, couldn't simulate a frightening public speaking activity or display the vastness of the solar system. The production process in a virtual environment, however, is quite different. A skilled instructional developer in such a setting would build structures, walkways, and interactive objects. Much research is needed to help direct instructional developers working in immersive spaces to create original learning experiences, to assess them and gauge improvements.

Privacy and safety: Every recent innovation in human communication was forced to address the issues of privacy protection, access, and disorganization in the information space. The privacy issue is basically solved here when each student assumes an avatar name. Delicate information such as grades and personal contact information is contained within the learning management system itself and is not accessible from the virtual environment. Although students occasionally complain about unpleasant encounters with strangers, it should be noted that the SLIS campus itself was basically free of outside disturbances. The campus is regarded as a safe sanctuary with adequate tools for controlling access. Research is needed to establish proper procedures for admitting friends and rejecting would-be “enemies” from campuses. Also, the metadata supplied in the virtual world is lacking. Students could easily stumble on adult-oriented content without warning. Second Life has a voluntary rating system to denote adult content, but this is mostly ignored. Researchers could determine ways to tag appropriately, sort accurately and search 3D content and then propose standards and procedures to industry.

Conclusion

San Jose State University's School of Library and Information Science has set the trend in LIS programs entering a new era of diverse technological education and digital literacy. Students indicate that they find the courses and the Second Life learning environment highly engaging. However, they required a greater degree of structured activities and in-world synchronous meetings, and complained about the number of encounters with rude strangers, particularly during their first forays. The immersive environments course itself was most effective when blending hands-on constructivist activities as simulated in virtual environments with reflective writing exercises in the web-based learning management system. The class continues to evolve with new service learning projects, an evolution of the e-portfolio culminating experience simulated in virtual space (or v-portfolio) and the addition of self-paced

quests. Like professionals in the field, educators and researchers in the academy seek new and engaging means of bringing information, ideas and people together. In this regard, San Jose is focusing on educating a generation of librarians and information professionals who will work with both digital natives and digital immigrants (Prensky, 2001a, 2001b) in new, creative and currently unknown ways.

References

- Abram, S. (2006). Web 2.0, and librarian 2.0: Preparing for the 2.0. *World SirsiDynix OneSource*, 2(1). Retrieved March 31, 2008, from http://www.imakenews.com/sirsi/e_article000505688.cfm
- Au, W.J. (2006). *New world notes blog: New world numbers: The trouble with two million*. Retrieved February 23, 2008, from http://nwn.blogs.com/nwn/2006/11/new_world_numbe.html
- Baker, C. (2008, March 24). Trying to design a truly entertaining game can defeat even a certified genius. [Electronic version]. *Wired*, 16(4) Retrieved April 3, 2008, from http://www.wired.com/gaming/gamingreviews/magazine/16-04/pl_games
- Barab, S.A., Hay, K.E., Barnett, M., & Squire, K. (2001). Constructing virtual worlds: Tracing the historical development of learner practices. *Cognition and Instruction*, 19(1), p. 47-94. Retrieved December 19, 2007, from <http://inkido.indiana.edu/research/onlinemanu/papers/cogin.pdf>
- Cohen, K. (2006, August 17). Right-click to learn: Second life offers students a virtually real education. [Electronic version]. *Boston Phoenix*, Retrieved March 31, 2008, from http://thephoenix.com/article_ektid20561.aspx
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper & Row.
- Dede, C., Bowman, C., Nelson, B., Clarke, J., & Ketelhut, D. J. (2004). *Design-based research strategies for studying situated learning in a multi-user virtual environment*. Paper presented at the 6th International Conference on Learning Sciences. Retrieved March 31, 2008 from <http://muve.gse.harvard.edu/rivercityproject/documents/dedeICLS04.pdf>
- Garrison, D.R., Anderson, T., & Archer, W. (1999). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2-3), 87-105. Retrieved March 31, 2008, from http://communitiesofinquiry.com/files/Critical_Inquiry_model.pdf
- Harper, R. (2007, February 23). *Second Life Wiki: Origin of the term 'resident'*. Retrieved March 31, 2008, from https://wiki.secondlife.com/wiki/Origin_of_the_term_%27Resident%27
- Jones, M., Kear, K., & Reilly, A. (1998). The design, development and use of a CD-ROM resource library for an Open University course. *British Journal of Educational Technology*, 29(3), 241-254.
- Kaiser Family Foundation (2005). Bedrooms have become multi-media centers; Kids say parents don't set or enforce rules on media use. Retrieved June 11, 2008, from <http://www.kff.org/entmedia/entmedia030905nr.cfm>
- Kemp, J. (2007a). *Libr 246: Virtual Worlds Workshop, Summer 2007 Syllabus*. Retrieved March 15, 2007, from <http://slisweb.sjsu.edu/courses/246.kemp/246su07gs.htm>
- Kemp, J. (2007b). *Libr 287: Virtual Worlds Workshop, Fall 2007 Syllabus*. Retrieved February 23, 2008 from <http://slisweb.sjsu.edu/courses/287.kemp/287fa07gs.htm>
- Kemp, J. (2008). *Libr 287: Virtual worlds workshop, Spring 2008 syllabus*. Retrieved February 23, 2008 from <http://slisweb.sjsu.edu/courses/287.kemp/287sp08gs.htm>
- Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical principles of distance education* (pp. 22-32). New York: Routledge.
- New Media Consortium. (2005). *A Global Imperative: the Report of the 21st Century Literacy Summit*. Retrieved December 21, 2007, from <http://www.nmc.org/publications/global-imperative>

- Ondrejka, C.R. (2004). Avatars, moguls, fashionistas and barons: Economics and ownership in second life. *Gamasutra*, May 11, 2006. Retrieved March 31, 2008, from <http://ssrn.com/abstract=614663>
- Prensky, M. (2001a, September/October). Digital natives, digital immigrants. *On the Horizon*, 9(5), 1-6.
- Prensky, M. (2001b, November/December). Digital natives, digital immigrants. *On the Horizon*, 9(6), 1-6.
- Rubel, S. (2006). *Micro persuasion blog: Second Life hype vs. reality*. Retrieved February 23, 2008, from http://www.micropersuasion.com/2006/08/second_life_hyp.html
- Schnerdin, J. (Ed.). (1994). *Discovering librarians; Profiles of a profession*. Chicago: ALA.
- Second life | economic statistics*. (2008). Retrieved February 23, 2008, from http://secondlife.com/whatis/economy_stats.php
- Sommer, A.K. (2005, October 09). *Using virtual reality to confront public speaking phobia*. Israel21c: A focus beyond. Retrieved June 11, 2008, from <http://www.israel21c.org/bin/en.jsp?enScript=PrintVersion.jsp&enDispWho=Articles^11117>
- Wagner, M. (2007, April 26). Gartner predicts 80% of internet users will be active in virtual worlds. [Electronic version]. *InformationWeek*. Retrieved March 31, 2008, from http://www.informationweek.com/blog/main/archives/2007/04/gartner_predict.html
- White, B. (2007). *Second Life: A Guide to Your Virtual World*. Indianapolis: Que.
- Woodcock, B.S. (2008) *An analysis of MMOG subscription growth*. Retrieved March 31, 2008, from <http://www.mmogchart.com/analysis-and-conclusions>

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